

NASA TECH BRIEF

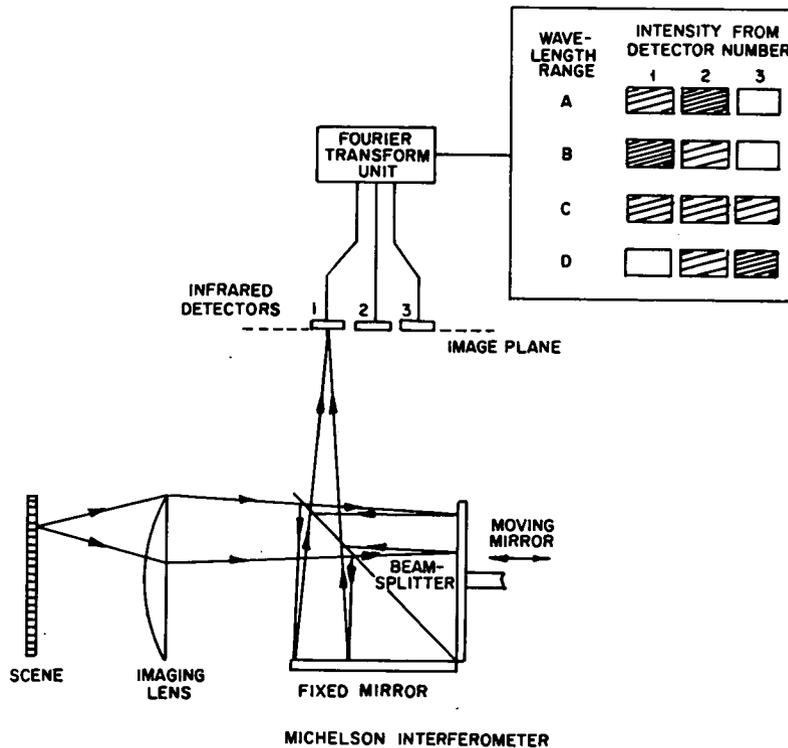
Manned Spacecraft Center



NASA Tech Briefs announce new technology derived from the U.S. space program. They are issued to encourage commercial application. Tech Briefs are available on a subscription basis from the National Technical Information Service, Springfield, Virginia 22151. Requests for individual copies or questions relating to the Tech Brief program may be directed to the Technology Utilization Office, NASA, Code KT, Washington, D.C. 20546.

Multispectral Infrared Imaging Interferometer

IMAGE DISPLAY UNIT
(FOUR THREE-ELEMENT IMAGES ARE SHOWN)



The problem:

Infrared images have been produced by placing an infrared filter over a detector. A different filter was required for each wavelength and viewing the image at a different wavelength required changing the filter. Simultaneous viewing of a scene at different wavelengths was impossible.

The solution:

A method of simultaneously viewing infrared images at many different wavelengths has been developed. The invention consists of an imaging lens, a Michelson interferometer, an array of infrared detectors, electronic data processing equipment for Fourier transformation of the detector signal, and an image display unit.

(continued overleaf)

How it's done:

The multispectral infrared imaging interferometer is shown: Light from the source is passed through a Michelson interferometer and imaged on the detector array, each element of which views a small portion of the scene. When the interferometer is operated, each detector receives an interferogram which is mathematically related to the spectrogram of the light. The interferograms are digitally sampled, transferred to the Fourier transform unit, and mathematically transformed to spectrograms. The intensity from each detector at a particular wavelength can now be determined and the data used to construct a picture of the object.

This information may be of interest in earth resources applications, non-destructive testing and medical diagnosis.

Note:

Requests for further information may be directed to:

Technology Utilization Officer
Manned Spacecraft Center, Code JM7
Houston, Texas 77058
Reference: TSP71-10325

Patent status:

This invention is owned by NASA, and a patent application has been filed. Royalty-free, nonexclusive licenses for its commercial use will be granted by NASA. Inquiries concerning license rights should be made to:

Patent Counsel
Code AM
NASA Manned Spacecraft Center
Houston, Texas 77058

Source: Dr. Andrew E. Potter, Jr.
Manned Spacecraft Center
(MSC-12404)